

## Commercial Space Transportation

# QUARTERLY LAUNCH REPORT

Featuring the  
launch results from  
the 4th quarter 2002  
and forecasts for  
the 1st quarter 2003  
and 2nd quarter 2003



## 1st Quarter 2003

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## Introduction

*The First Quarter 2003 Quarterly Launch Report features launch results from the fourth quarter of 2002 (October-December 2002) and launch forecasts for the first quarter of 2003 (January-March 2003) and second quarter of 2003 (April-June 2003). This report contains information on worldwide commercial, civil, and military orbital space launch events. Projected launches have been identified from open sources, including industry references, company manifests, periodicals, and government sources. Projected launches are subject to change.*

*This report highlights commercial launch activities, classifying commercial launches as one or both of the following:*

- *Internationally-competed launch events (i.e., launch opportunities considered available in principle to competitors in the international launch services market)*
- *Any launches licensed by the Associate Administrator for Commercial Space Transportation of the Federal Aviation Administration under 49 United States Code Subtitle IX, Chapter 701 (formerly the Commercial Space Launch Act)*

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Cover: The inaugural launch of Boeing's Delta 4 Medium Plus (4,2), carrying Eutelsat W5, takes place from Cape Canaveral Air Force Station on November 20, 2002. The Delta 4, which is marketed by Boeing Launch Services (BLS), was developed under the Evolved Expendable Launch Vehicle (EELV) program managed by the United States Air Force.

## Fourth Quarter 2002 Highlights

Boeing successfully launched its first Delta 4 vehicle from Launch Complex 37 at Cape Canaveral on November 20, placing Eutelsat's W5 communications satellite into geosynchronous transfer orbit. The Delta 4 Medium Plus (4,2) launch represents the second launch of an Evolved Expendable Launch Vehicle (EELV). The first was Lockheed Martin's Atlas 5 401, which was launched in the summer.

A Soyuz booster exploded above its launch pad in Plesetsk on October 15, representing the first failure for that vehicle in eight years. The explosion was caused by a stray object in a pipe leading to an engine in one of the vehicle's first-stage liquid strap-on boosters.

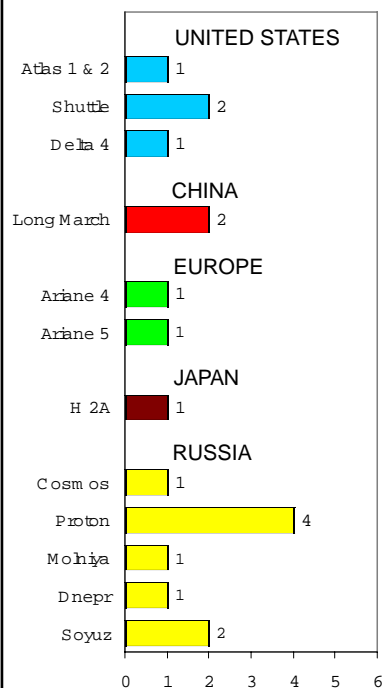
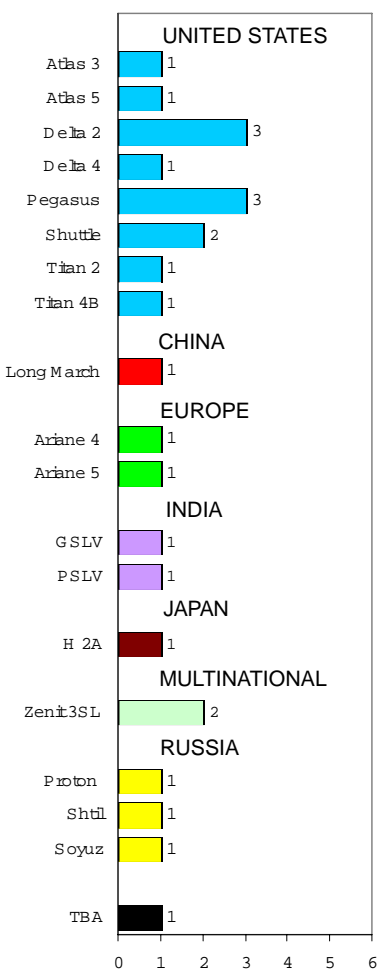
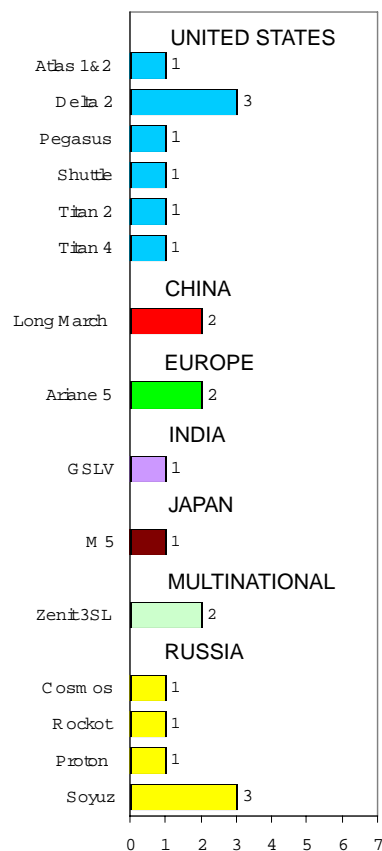
A Proton K launch conducted by International Launch Services (ILS) failed on November 26 when its Block DM upper stage failed to place SES Astra's Astra 1K satellite into the proper orbit. The upper stage failed to re-ignite as programmed, and eventually the satellite was deorbited after being declared a total loss. Excess propellant in the Block DM stage engine apparently caused overheating and an explosion during ignition of the stage's second burn, leading the satellite to separate in a low transfer orbit.

Arianespace's new Ariane 5 ECA launch vehicle failed about three minutes after launch on December 11. Two communications satellites, Eutelsat's Hot Bird 7 and the French space agency's (CNES) Stentor, were lost when range safety personnel sent a command to the vehicle to self destruct after the first stage demonstrated "erratic behavior." Data indicate that the Vulcain 2 main engine under-performed during ascent and did not suffer an instant failure. A review board released a report in January 2003 concluding that the most probable cause of the failure was the degraded thermal condition of the Vulcain 2 engine nozzle due to fissures in the cooling tubes combined with unexpected loads on the engine during flight.

Arianespace projects a profit in 2003 after two unprofitable years. The company has restructured its commercial and financial offices and has realigned its working relationship with European aerospace companies like the European Aeronautic Defence and Space Company (EADS) and Snecma. Arianespace is also seeking more government support in light of a lower projected demand for launch services.

## Vehicle Use

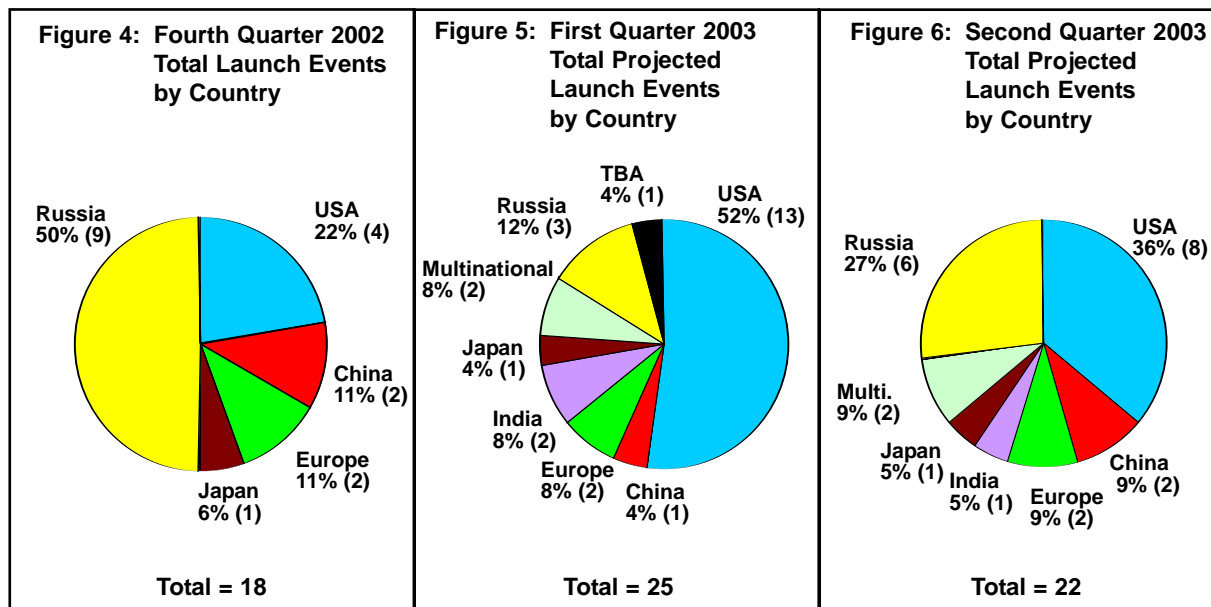
(October 2002 – June 2003)

**Figure 1: Fourth Quarter 2002  
Total Launch Vehicle Use****Total = 18****Figure 2: First Quarter 2003  
Total Projected Launch  
Vehicle Use****Total = 25****Figure 3: Second Quarter 2003  
Total Projected Launch Vehicle Use****Total = 22**

**Figures 1-3** show the total number of orbital launches (commercial and government) of each launch vehicle that occurred in the fourth quarter of 2002 and that are projected for the first and second quarters of 2003. These launches are grouped by the country in which the primary vehicle manufacturer is based. Exceptions to this grouping are launches performed by Sea Launch, which are designated as multinational.

## Total Launch Events by Country

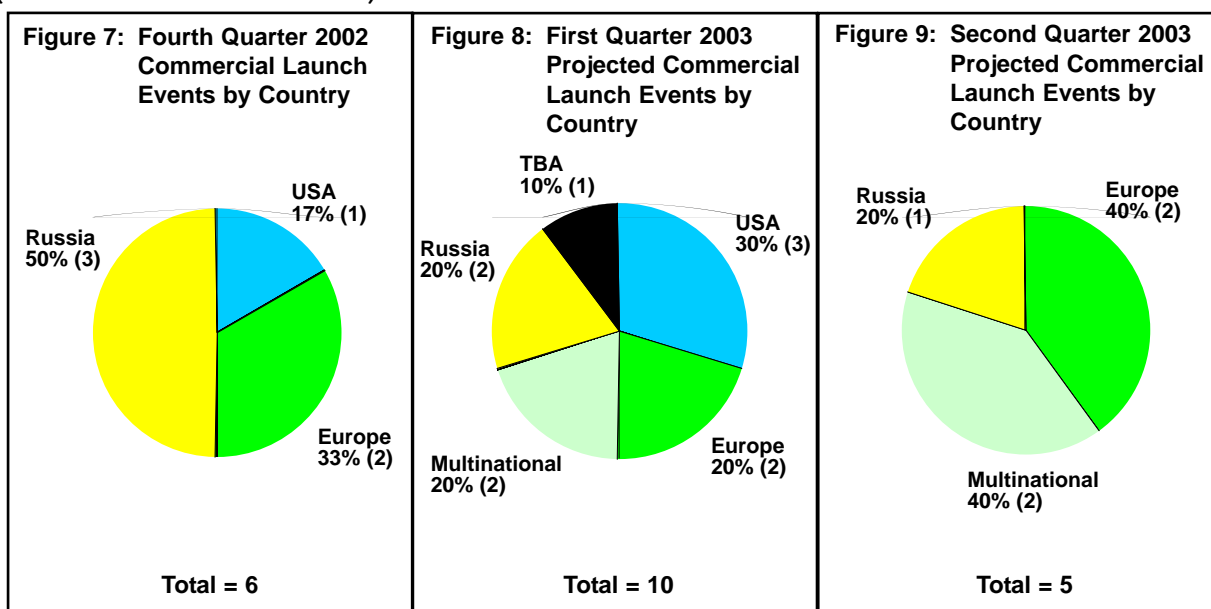
(October 2002 – June 2003)



Figures 4-6 show all orbital launch events (commercial and government) that occurred in the fourth quarter of 2002 and that are projected for the first and second quarters of 2003.

## Commercial Launch Events by Country

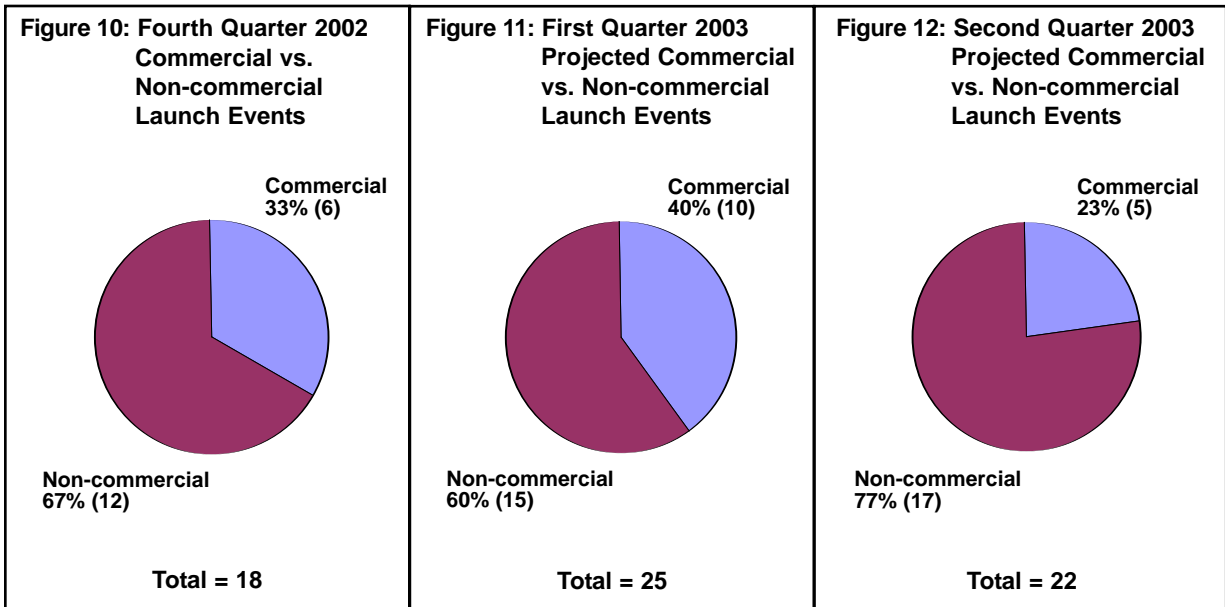
(October 2002 – June 2003)



Figures 7-9 show all *commercial* orbital launch events that occurred in the fourth quarter of 2002 and that are projected for the first and second quarters of 2003.

**Commercial vs. Non-commercial Launch Events**

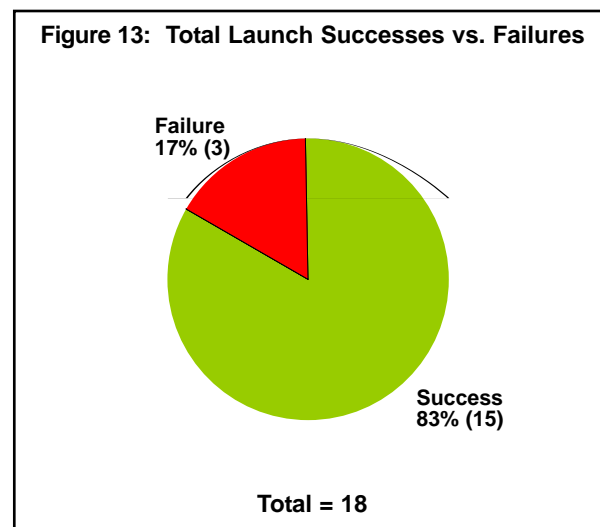
(October 2002 – June 2003)



**Figures 10-12** show commercial vs. non-commercial orbital launch events that occurred in the fourth quarter of 2002 and that are projected for the first and second quarters of 2003.

**Fourth Quarter 2002 Launch Successes vs. Failures**

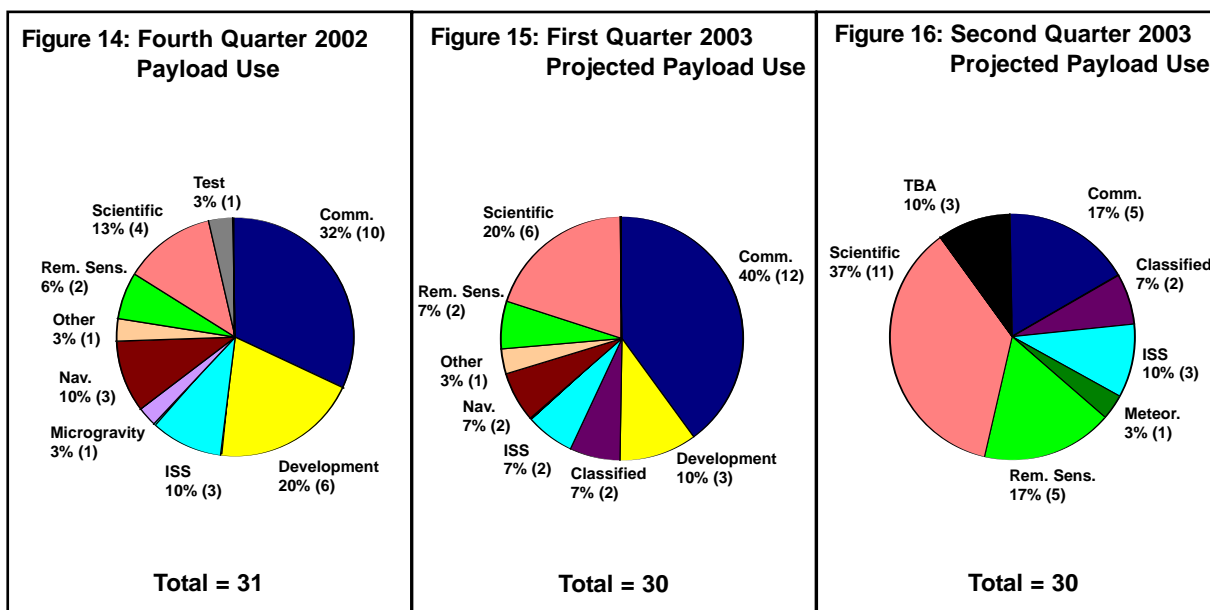
(October 2002 – December 2002)



**Figure 13** shows successful vs. failed orbital launch events that occurred in the fourth quarter of 2002.

## Payload Use

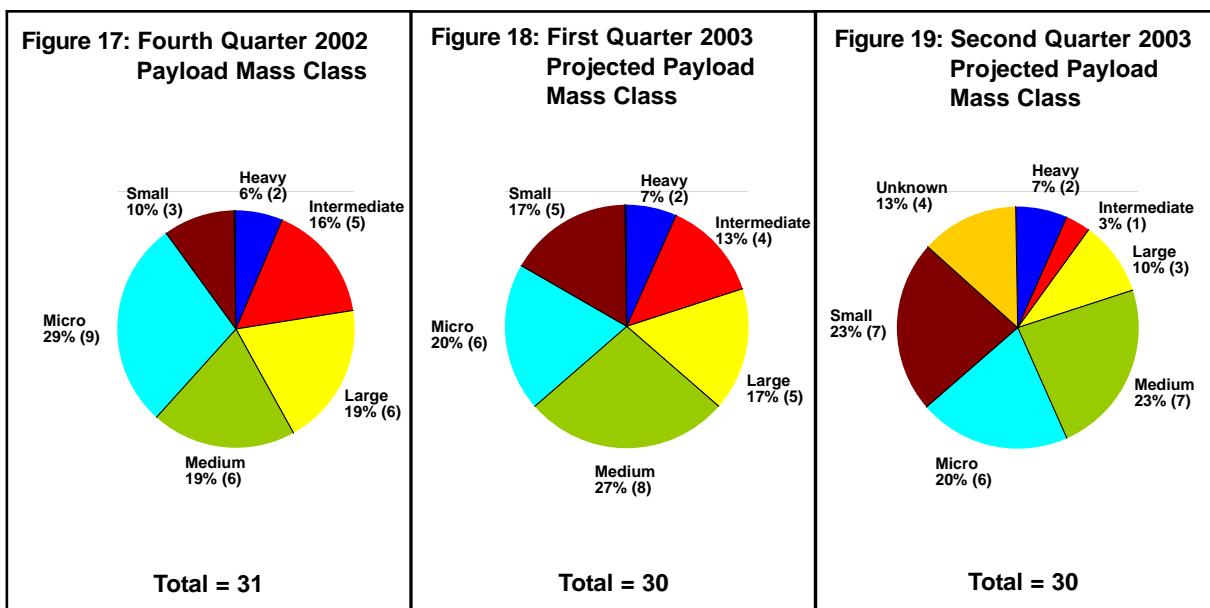
(October 2002 – June 2003)



Figures 14-16 show total payload use (commercial and government), actual for the fourth quarter of 2002 and that are projected for the first and second quarters of 2003. The total number of payloads launched may not equal the total number of launches due to multi-manifesting, i.e., the launching of more than one payload by a single launch vehicle.

## Payload Mass Class

(October 2002 – June 2003)

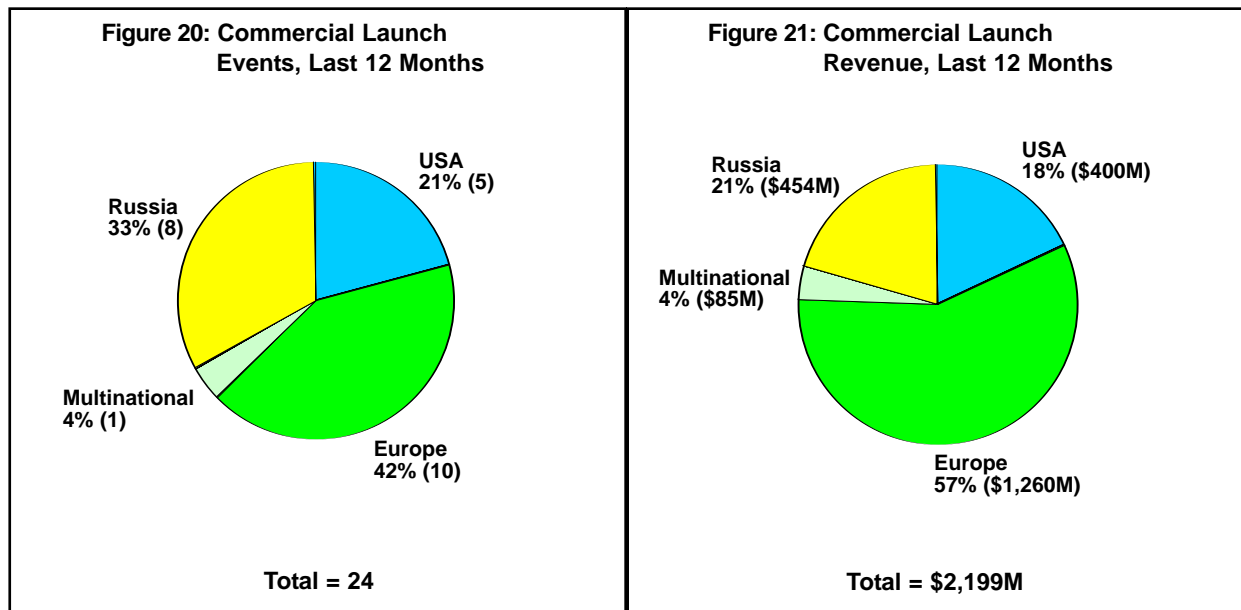


Figures 17-19 show total payloads by mass class (commercial and government), actual for the fourth quarter of 2002 and projected for the first and second quarters of 2003. The total number of payloads launched may not equal the total number of launches due to multi-manifesting, i.e., the launching of more than one payload by a single launch vehicle. Payload mass classes are defined as Micro: 0 to 91 kilograms (0 to 200 lbs.); Small: 92 to 907 kilograms (201 to 2,000 lbs.); Medium: 908 to 2,268 kilograms (2,001 to 5,000 lbs.); Intermediate: 2,269 to 4,536 kilograms (5,001 to 10,000 lbs.); Large: 4,537 to 9,072 kilograms (10,001 to 20,000 lbs.); and Heavy: over 9,072 kilograms (20,000 lbs.).



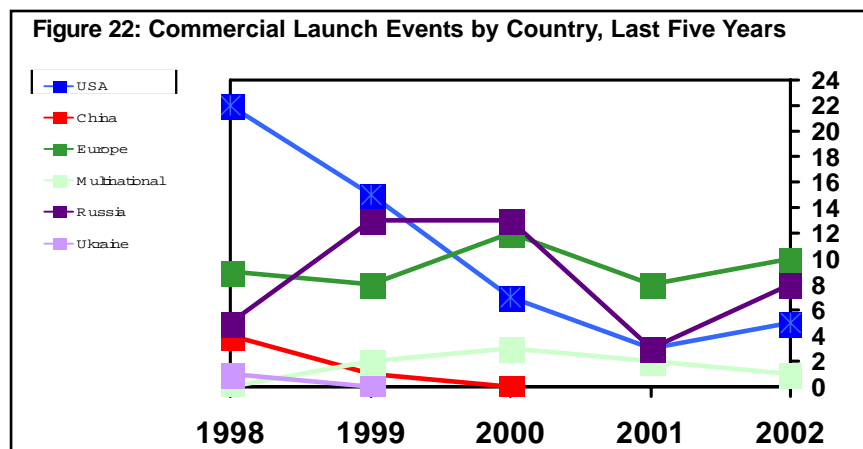
## Commercial Launch Trends

(January 2002 – December 2002)

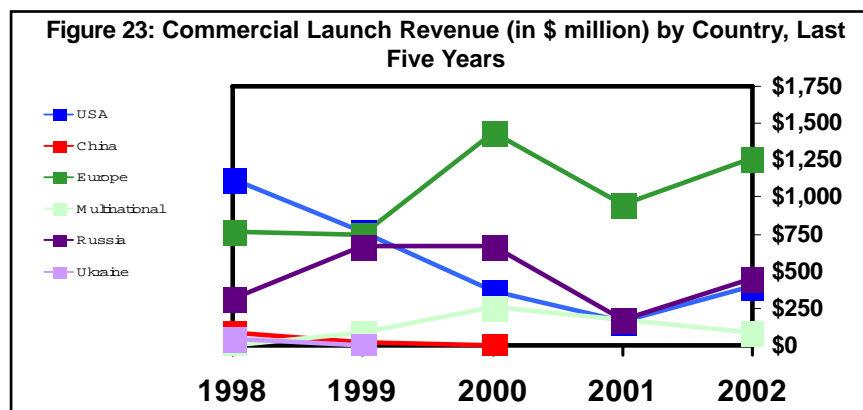


**Figure 20** shows commercial launch events for the period January 2002 to December 2002 by country.

**Figure 21** shows commercial launch revenue for the period January 2002 to December 2002 by country.



**Figure 22** shows commercial launch events by country for the last five full years.



**Figure 23** shows commercial launch revenue by country for the last five full years.



# FIRST QUARTER 2003 QUARTERLY LAUNCH REPORT

## APPENDIX A: FOURTH QUARTER 2002 LAUNCH EVENTS

Date	Vehicle	Site	Payload or Mission	Operator	Use	Vehicle Price	L M
10/7/02	Shuttle Atlantis	KSC	STS 112 ISS 9A	NASA ISS Partner Nations	Crewed ISS	\$300M	S S
10/15/02	Soyuz	Plesetsk	Foton 13	Rosaviakosmos	Microgravity	\$30-50M	F F
10/17/02	Proton K	Baikonur	INTEGRAL	European Space Agency	Scientific	\$60-85M	S S
10/27/02	Long March 4B	Taiyuan	Ziyuan 2B	China Aerospace Corporation	Remote Sensing	\$25-35M	S S
10/30/02	Soyuz	Baikonur	Soyuz ISS 5S	ISS Partner Nations	ISS	\$65M	S S
11/20/02	V + Delta 4 Medium-Plus (4,2)	CCAFS	* Eutelsat W5	Eutelsat	Communications	\$70-85M	S S
11/22/02	Shuttle Endeavour	KSC	STS 113 ISS 11A	NASA ISS Partner Nations	Crewed ISS	\$300M	S S
11/26/02	V Proton K	Baikonur	* Astra 1K	SES Astra	Communications	\$60-85M	F F
11/28/02	Cosmos	Plesetsk	Mozhayets	Mozhaiskiy Military Space Engineering Academy (Russia)	Other	\$12M	S S
			AlSat 1	Disaster Monitoring Constellation Consortium	Scientific		S
			RUBIN 3-DSI	OHB-System (Germany)	Development		S
12/5/02	Atlas 2A	CCAFS	TDRS J	NASA	Communications	\$75-85M	S S
12/11/02	V Ariane 5 ECA	Kourou	* Hot Bird 7 Stentor	Eutelsat CNES/France Telecom	Communications Communications	\$125-155M	F F
12/14/02	H 2A 202	Tanegashima	ADEOS 2	National Space Development Agency (Japan)	Remote Sensing	\$70-100M	S S
			MicroLabSat	National Space Development Agency (Japan)	Development		S
			FedSat 1	Cooperative Research Centre for Satellite Systems (Australia)	Scientific		S
			WEOS	Chiba Institute of Technology (Japan)	Scientific		S

/ Denotes commercial launch, defined as a launch that is internationally-competed or FAA-licensed.

+ Denotes FAA-licensed launch.

\* Denotes a commercial payload, defined as a spacecraft that serves a commercial function or is operated by a commercial entity.

L and M refer to the outcome of the Launch and Mission (immediate status of the payload upon reaching orbit): S = success, P = partial success, F = failure

Note: All launch dates are based on local time at the launch site at the time of launch.

# FIRST QUARTER 2003 QUARTERLY LAUNCH REPORT

## APPENDIX A: FOURTH QUARTER 2002 LAUNCH EVENTS

Fourth Quarter 2002 Orbital Launch Events							
Date	Vehicle	Site	Payload or Mission	Operator	Use	Vehicle Price	L M
12/17/02	/ Ariane 44L	Kourou	* NSS 6	New Skies Satellites N.V.	Communications	\$85-125M	S S
12/20/02	/ Dnepr 1	Svobodny	* LatinSat 1	Aprize Satellite Argentina	Communications	\$8-11M	S S
			* LatinSat 2	Aprize Satellite Argentina	Communications		S
			SaudiSat 2	Riyadh Space Research Institute (Saudi Arabia)	Development		S
			Unisat 2	University of Rome, La Sapienza	Development		S
			RUBIN 2	OHB-System (Germany)	Development		S
			* Trailblazer Structural Test Article	TransOrbital	Test		S
12/24/02	Molniya	Plesetsk	Kosmos 2393	Russian Federation Ministry of Defense	Communications	\$30-40M	S S
12/26/02	Proton K	Baikonur	Kosmos 2394 (Glonass M R4)	Russian Federation Ministry of Defense	Navigation	\$60-85M	S S
			Kosmos 2394 (Glonass M R5)	Russian Federation Ministry of Defense	Navigation		S
			Kosmos 2394 (Glonass M R6)	Russian Federation Ministry of Defense	Navigation		S
12/29/02	/ Proton M	Baikonur	* Nimiq 2	Telesat Canada	Communications	\$70-100M	S S
12/29/02	Long March 2F	Jiuquan	Shenzhou 4	China National Space Administration	Development	\$50-65M	S S

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L and M refer to the outcome of the Launch and Mission (immediate status of the payload upon reaching orbit): S = success, P = partial success, F = failure

Note: All launch dates are based on local time at the launch site at the time of launch.

# FIRST QUARTER 2003 QUARTERLY LAUNCH REPORT

## APPENDIX B: FIRST QUARTER 2003 PROJECTED LAUNCH EVENTS

Date	Vehicle	Site	Payload or Mission	Operator	Use	Vehicle Price
1/6/03	Titan 2	VAFB	Coriolis	US Navy	Scientific	\$30-40M
1/13/03	Delta 2 7320	VAFB	ICESat CHIPSat	NASA NASA	Scientific Scientific	\$45-55M
1/16/03	Shuttle Columbia	KSC	STS 107	NASA	Scientific	\$300M
1/21/03	Titan 4B/Centaur	CCAFS	Milstar F6	USAF	Communications	\$350-450M
1/25/03	Pegasus XL	CCAFS	SORCE	University of Colorado	Scientific	\$14-18M
1/29/03	Delta 2 7925-10	CCAFS	Navstar GPS 2R-8 XSS-10	USAF Air Force Research Laboratory	Navigation Development	\$45-55M
2/2/03	Delta 4 Medium	CCAFS	DSCS 3-13	USAF	Communications	\$65-75M
2/2/03	Soyuz	Baikonur	Progress ISS 10P	ISS Partner Nations	ISS	\$30-50M
2/10/03	V Proton M	Baikonur	* AMC 9	SES Americom	Communications	\$70-100M
2/12/03	V Ariane 44L	Kourou	* Intelsat 907	Intelsat	Communications	\$85-125M
2/2003	GSLV	Professor Satish Dhawan Space Center	Gsat 2	Indian Space Research Organization	Communications	\$30-40M
2/2003	V + Zenit 3SL	Odyssey Launch Platform	* EchoStar 9	Echostar Communications Corporation	Communications	\$65-85M
3/1/03	Shuttle Atlantis	KSC	STS 114 ISS ULF-1	NASA ISS Partner Nations	Crewed ISS	\$300M
3/11/03	V + Atlas 5 401	CCAFS	* Hellas-Sat 2	Hellas Sat Consortium Ltd.	Communications	\$65-75M
3/28/03	Pegasus XL	CCAFS	GALEX	NASA	Scientific	\$14-18M
3/29/03	Delta 2 7925-10	CCAFS	Navstar GPS 2R-9 ProSEDS 2	USAF NASA	Navigation Development	\$45-55M
3/2003	V + Atlas 3B	CCAFS	* AsiaSat 4	Asiasat	Communications	\$65-75M
3/2003	V + Pegasus XL	VAFB	* OrbView 3	ORBIMAGE	Remote Sensing	\$14-18M
V Denotes commercial launch, defined as a launch that is internationally-competed or FAA-licensed.						
+ Denotes FAA-licensed launch.						
* Denotes a commercial payload, defined as a spacecraft that serves a commercial function or is operated by a commercial entity.						

# FIRST QUARTER 2003 QUARTERLY LAUNCH REPORT

## APPENDIX B: FIRST QUARTER 2003 PROJECTED LAUNCH EVENTS

First Quarter 2003 Projected Orbital Launch Events						
Date	Vehicle	Site	Payload or Mission	Operator	Use	Vehicle Price
3/2003	H 2A 2024	Tanegashima	Japan Optical 1 Japan Radar 1	Japan Defense Agency Japan Defense Agency	Classified Classified	\$70-100M
1Q/2003	✓ Shtil	Barents Sea	Cosmos 1	The Planetary Society	Development	\$1-2M
1Q/2003	✓ Ariane 5 TBA	Kourou	* Insat 3A	Indian Space Research Organization	Communications	\$125-155M
			* Galaxy 12	PanAmSat	Communications	
1Q/2003	✓ TBA	TBA	* QuakeSat	QuakeFinder	Other	TBA
1Q/2003	✓ + Zenit 3SL	Odyssey Launch Platform	* Telstar 8	Loral Skynet	Communications	\$65-85M
1Q/2003	PSLV	Professor Satish Dhawan Space Center	IRS P6	Indian Space Research Organization	Remote Sensing	\$15-17M
1Q/2003	Long March TBA	Taiyuan	Chuang Xing 1	Chinese Academy of Sciences	Communications	TBA

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+ Denotes FAA-licensed launch.

\* Denotes a commercial payload, defined as a spacecraft that serves a commercial function or is operated by a commercial entity.

# FIRST QUARTER 2003 QUARTERLY LAUNCH REPORT

## APPENDIX C: SECOND QUARTER 2003 PROJECTED LAUNCH EVENTS

Date	Vehicle	Site	Payload or Mission	Operator	Use	Vehicle Price
4/12/03	✓ + Zenit 3SL	Odyssey Launch Platform	* Thuraya 2	Thuraya Satellite Communciations Company	Communications	\$65-85M
4/15/03	Delta 2 7920H	CCAFS	Space Infrared Telescope Facility	NASA	Scientific	\$45-55M
4/26/03	Soyuz	Baikonur	Soyuz ISS 6S	ISS Partner Nations	ISS	\$65M
4/2003	Proton M	Baikonur	Yamal 201 Yamal 202	A/O Gazkom/Energia A/O Gazkom/Energia	Communications Communications	\$70-100M
5/20/03	Pegasus XL	VAFB	Scisat 1	Canadian Space Agency	Scientific	\$14-18M
5/23/03	Shuttle Discovery	KSC	STS 115 ISS 12A	NASA ISS Partner Nations	Crewed ISS	\$300M
5/26/03	Soyuz	Baikonur	Progress ISS 11P	ISS Partner Nations	ISS	\$30-50M
5/30/03	Delta 2 7925-10	CCAFS	Mars Explorer Rover A	NASA	Scientific	\$45-55M
5/2003	M 5	Kagoshima	Muses C	Institute of Space and Astronautical Science (Japan)	Scientific	\$50-60M
5/2003	✓ Cosmos	Plesetsk	BiSat 1 BNSCSat NigeriaSat 1 Thai-Paht 2	Disaster Monitoring Constellation Consortium Disaster Monitoring Constellation Consortium Disaster Monitoring Constellation Consortium Disaster Monitoring Constellation Consortium	Remote Sensing Remote Sensing Remote Sensing Remote Sensing	\$12M
5/2003	Titan 2	VAFB	DMSP 5D-3-F16	USAF	Meteorological	\$30-40M
6/1/03	Soyuz	Baikonur	Mars Express Orbiter Beagle 2	European Space Agency European Space Agency	Scientific Scientific	\$30-50M
6/9/03	Titan 4B	CCAFS	NRO T1	National Reconnaissance Office	Classified	\$350-450M
6/23/03	Atlas 2AS	VAFB	NRO A3	National Reconnaissance Office	Classified	\$65-75M
6/25/03	Delta 2 7925H	CCAFS	Mars Explorer Rover B	NASA	Scientific	\$45-55M
6/2003	Long March 2C	Jiuquan	Double Star Equator	European Space Agency	Scientific	\$20-25M
2Q/2003	✓ Ariane 5 TBA (see note below)	Kourou	TBA SMART 1	TBA European Space Agency	TBA Scientific	\$125-155M
✓ Denotes commercial launch, defined as a launch that is internationally-competed or FAA-licensed. + Denotes FAA-licensed launch. * Denotes a commercial payload, defined as a spacecraft that serves a commercial function or is operated by a commercial entity. <b>Note:</b> Ariane 5 payloads are usually multi-manifested, but the pairing of satellites scheduled for each launch is sometimes undisclosed for proprietary reasons until shortly before the launch date.						

# FIRST QUARTER 2003 QUARTERLY LAUNCH REPORT

## APPENDIX C: SECOND QUARTER 2003 PROJECTED LAUNCH EVENTS

Second Quarter 2003 Projected Orbital Launch Events						
Date	Vehicle	Site	Payload or Mission	Operator	Use	Vehicle Price
2Q/2003	GSLV	Professor Satish Dhawan Space Center	Gsat 3	Indian Space Research Organization	Communications	\$30-40M
2Q/2003	+ Zenit 3SL	Odyssey Launch Platform	* Horizons 1	Horizons	Communications	\$65-85M
2Q/2003	Rockot	Plesetsk	MOST Mimosa	Canadian Space Agency Czech Astronomical Institute	Scientific Scientific	\$12-15M
2Q/2003	+ Ariane 5 TBA (see note below)	Kourou	TBA TBA	TBA TBA	TBA TBA	\$125-155M
2Q/2003	Long March 4B	Taiyuan	CBERS/Ziyuan 2	China/Brazil	Remote Sensing	\$25-35M

+ Denotes commercial launch, defined as a launch that is internationally-competed or FAA-licensed.

+ Denotes FAA-licensed launch.

\* Denotes a commercial payload, defined as a spacecraft that serves a commercial function or is operated by a commercial entity.

**Note:** Ariane 5 payloads are usually multi-manifested, but the pairing of satellites scheduled for each launch is sometimes undisclosed for proprietary reasons until shortly before the launch date.